Emergency Tillage for Wind Erosion Control

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EMERGENCY TILLAGE FOR WIND EROSION CONTROL

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A dense cover of growing plants or plant residue is the best protection against wind erosion. But when plant cover is not adequate or is depleted, other methods of controlling wind erosion are needed. Emergency tillage is commonly used to provide temporary protection.

The purpose of emergency tillage is to break up the smooth surface of a bare field into rough clods that resist the force of wind. The protection is temporary because wind and rain eventually break down the clods and the field becomes smooth again.

Emergency tillage should be used only if standard conservation measures, such as cover crops, plant residues, and windbreaks, fail to control erosion because of severe drought or other causes. Avoiding unnecessary tillage is important in soil conservation because tillage buries plant residues, hastens the loss of organic matter and soil moisture, and breaks down soil structure.

This field has too little plant cover to protect it from wind erosion. Emergency tillage is needed before the windy season begins.

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Emergency tillage is less effective on sandy soil than on medium-textured and fine-textured soils. Fewer clods form in sandy soil, and a single tillage may protect the soil for only one or two periods of strong wind. Generally more clods form in medium-textured and fine-textured soils, and a single tillage protects the soils longer.

Emergency tillage is most effective if done just before strong winds blow. If you are not sure when the windy season is likely to begin, roughen the surface when the field first becomes smooth and bare.

Equipment

Listers, duckfoot cultivators, and chisels are most commonly used for emergency tillage. Their effectiveness depends to a great extent on soil texture and moisture content, depth of tillage, speed of travel, spacing between toolhead carriers, and the kind of toolhead.

Listers and chisels are most effective. Chisels are more widely used than listers because they require less power. Also chisels destroy less of a growing crop.

Solid listing is the best method for emergency tillage of sandy soil. Clods in sandy soil are not stable, and several listings may be needed before the windy season is over.

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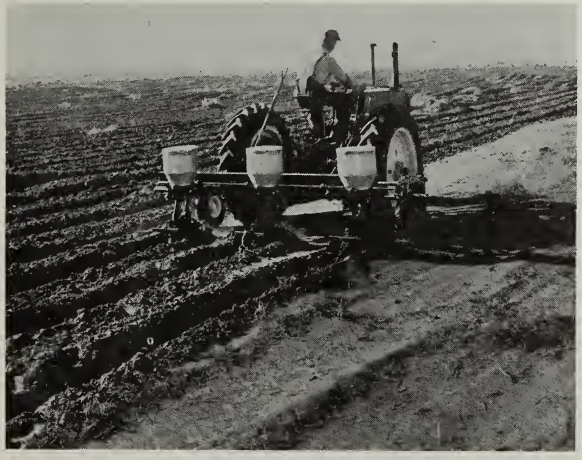

Direction and speed of tillage

Tillage generally should be at right angles to the direction of the most frequent erosive winds. If you intend to plant a row crop, till in the same direction or at right angles to the direction of the rows so that the tillage furrows do not interfere with the planter.

Tillage at a speed of 3.5 to 4 miles per hour is most effective. At higher speed, the tillage implement tends to pulverize clods. At lower speed, the tillage implement does not turn up enough clods.

Tillage of sandy and sandy loam soils

Solid listing is the best method for emergency tillage of sandy and sandy loam soils. The first listing should be about 6 to 8 inches deep in furrows 20 to 42 inches apart. You can use 14-inch listers spaced 42 inches apart or 8-inch listers spaced 20 to 24 inches apart. Later listings, if required, should be progressively deeper and can be either in or between the old furrows.

If row crop stubble is on the field, list be-

If row crop stubble is on the field, till between the rows and leave the stubble on the ridges. Even a small amount of stubble helps control wind erosion.

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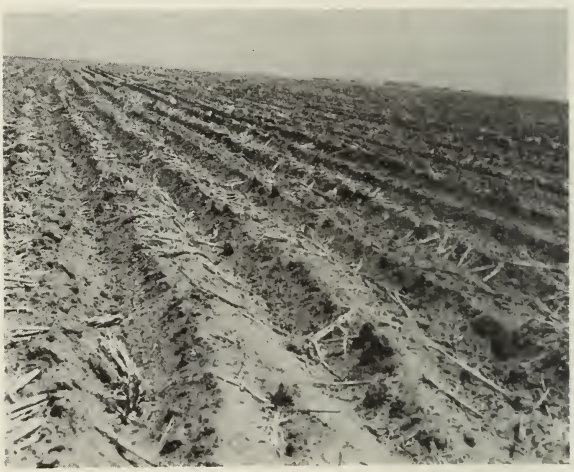

Chiseling in strips is an effective method for emergency tillage of medium-textured and fine-textured soils.
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tween the rows and leave the stubble on the ridges. Even a small amount of stubble helps control erosion.

Listing is sometimes needed to control wind erosion on a field that has a sparse cover of growing wheat. Wide spacing between listers may be adequate to protect the field and also make it possible to save more of the crop.

If you plan to use the field for a row crop, space chisels the same distance as between rows and run the chisels in the direction of the rows. In this way the chisel furrows will not interfere with the planter.
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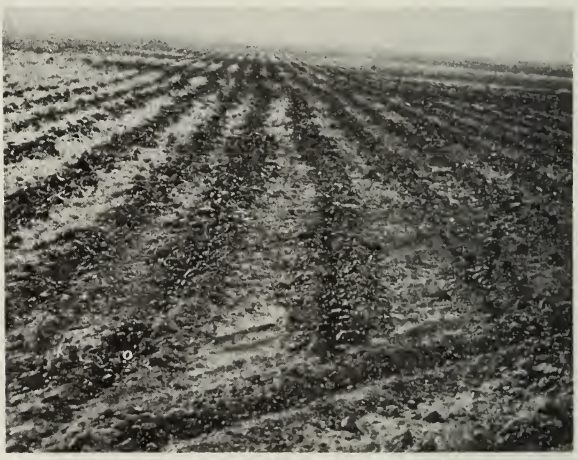

Tillage of medium-textured and fine-textured soils

Chiseling generally is the best method for emergency tillage of medium-textured and fine-textured soils. Chiseling can be solid or in strips.

Shovel chisels, 4 inches wide, running at a depth of 4 to 5 inches are generally effective in turning up clods and roughening the surface. If the soil is hard and compact, narrower chisels (about 2 inches wide) may be needed but the chisels can run at shallower depth.

In loose soil, chisels must run at greater depth to turn up clods. If chiseling at greater depth slows the tractor to less than 2 miles per hour, the chisels may not turn up enough clods. If chisels do not work in loose soil, use a lister in the way described for tillage of sandy and sandy loam soils.

If you intend to plant a row crop in the field, space chisels the same distance as between rows and chisel in the direction of the rows, so that the chisel furrows do not interfere with the planter. If the next crop is to be drilled or broadcast, chisel at right angles to the most frequent erosive winds.

Chiseling may be needed in a field of growing wheat. Wide spacing of chisels (up to 54 inches) may be adequate to protect the field and also make it possible to save more of the crop.

If more than one chiseling is needed during the windy season, run the chisels between the old chisel furrows.

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